VPDES PERMIT FACT SHEET

This document gives pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a Minor, Municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards (WQS) of 9 VAC 25-260. The discharge results from the treatment of wastewater from a campground and tourist attraction (SIC Code: 7999 – Amusement and Recreational Services). This permit action consists of reissuing the permit with revisions to the permit, as needed, due to changes in applicable laws, guidance, and available technical information.

1.	Facility Name and Address: Endless Caverns STP 1800 Endless Caverns Road New Market, VA 22844 Location: 1800 Endless Cav	i			
2.	Permit No. VA0071846			Expiration Date: Octo	ober 31, 2011
3.	Owner Contact: Name Title Telephone No	e: Manager			
4.	Application Complete Date	: July 6, 2011			
	Permit Drafted By: Dawn J Reviewed By: Kate H		Date: Date:		
	Public Comment Period: _		to		
5.	Receiving Stream Name: Watershed Name:	Smith Creek Basin: Potomac Section: 6e Special Standards: pH, P Impaired ☑ Yes ☐ No VAV-B47R Smith Creek		River Mile: 17.24 Subbasin: Shenandoah Class: IV Tidal Waters □ Yes	☑ No
6.	Operator License Requirem	ents per 9 VAC 25-31-200	.C: II		
7.	Reliability Class per 9 VAC I within 90 days of notificat Smith Creek.				
8.	Permit Characterization:				
	✓ Private ☐ Federal☐ Possible Interstate Effect	☐ State ☐ POTW t ☐ Interim Limits in Ot			
9.	Description of Treatment W	Vorks Treating Domestic S	ewage:		Appendix A
	Total Number of Outfalls =	1			
	Operation and Maintenance facility, the permittee shall s			npletion of construction o	of the treatment

Appendix B

10. Discharge Location Description and Receiving Waters Information:

11. Antidegradation Review & Comments per 9 VAC 25-260-30: Tier: 1

The State Water Control Board's WQS includes an antidegradation policy. All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 waters have water quality that is better than the WQS. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 waters are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with a Tier determination. Smith Creek in the immediate vicinity of the discharge is determined to be a Tier 1 waterbody. This finding is based on the fact that the stream is included on the currently approved 303(d) list for not meeting the General Standard (Benthics) for aquatic life use. Antidegradation baselines are not calculated for Tier 1 waters

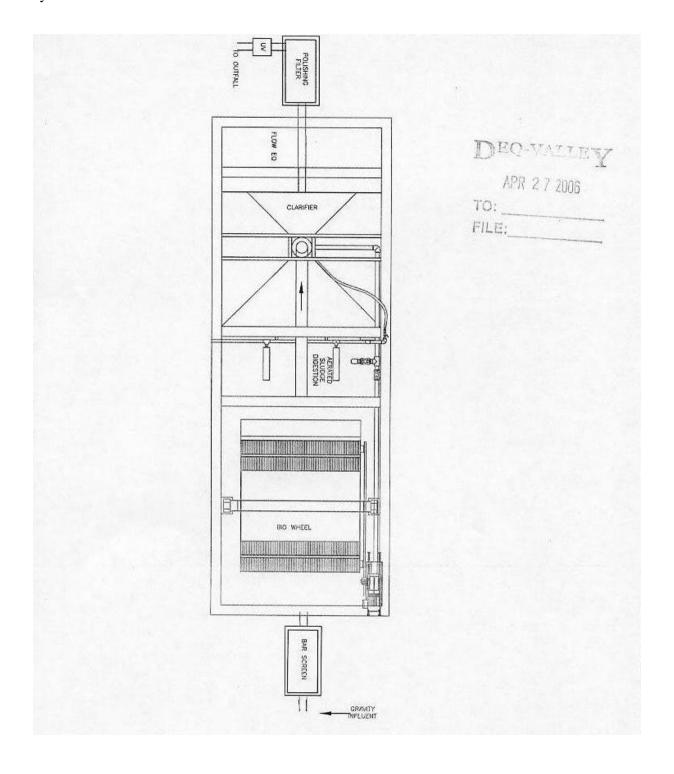
12.	Site Inspection:	Performed by:	Dawn Jeffries	Date: July 6, 2011	
13.	Effluent Screening a	nd Effluent Lin	nitations:		Appendix C
14.	Effluent toxicity test	ing requirement	ts included per 9 VAC 25-31-22	0.D: □ Yes ☑ No	
	(SIUs) or Cate contribute to i Industrial: The categories for	egorical Industrinstream toxicity is facility's SIC which aquatic t	not have a design flow ≥ 1.0 Medial Users (CIUs), and is not deerly. Code(s) and activities contribute toxicity monitoring is required, to deemed to have the potential to	med to have the potential ing wastewater do not fal he facility does not have	to cause or l within the an IWC =
15.			ne Sludge Management Plan (SM be hauled to the North River W		
16.	Permit Changes and	Bases for Spec	ial Conditions:		Appendix D
17.		ss the managem	280.B.2: This permit requires the nent of wastes, fluids, and polluta such materials.		
18.	Antibacksliding Rev the VPDES Permit R	•	25-31-220.L: This permit comp	plies with Antibacksliding	g provisions of
19.		impaired based	9 VAC 25-31-220.D: Smith Cr I on benthic impairment. This fa and bacteria.		
20.	Regulation of Users treatment works.	per 9 VAC 25-3	31-280.B.9: N/A – There are no	industrial users contribu	ting to the
21.	If "No," check one: ✓ STPs: This fa POTW pretree Others: This f	cility does not hatment program	AC 25-31-120: Application Requares a design flow ≥ 1.0 MGD, a under 9 VAC 25-31-10 et sequode(s) and activities do not fall was required.	nor is it required to have a	an approved

- 22. Compliance Schedule's per 9 VAC 25-31-250: None required by this permit.
- 23. Variances/Alternative Limits or Conditions per 9 VAC 25-31-280.B, 100.J, 100.P, and 100.M: The permittee has not requested waivers from sampling required as part of the application.
- 24. Financial Assurance Evaluation per 9 VAC 25-650-10: N/A No private homes are served by this facility.
- 25. Nutrient Trading Regulation per 9 VAC 25-820:
 Watershed General Permit (WGP) Required: □ Yes ☑ No
- 26. Threatened and Endangered (T&E) Species Screening per 9 VAC 25-260-20 B.8: T&E screening was performed in accordance with the VPDES Memorandum of Understanding. Comments are expected before the finalization of the permit and will be considered upon receipt.
- 27. Virginia Environmental Excellence Program (VEEP) Evaluation per § 10.1-1187.1-7: Is this facility considered by DEQ to be a participant in the Virginia Environmental Excellence Program in good standing at either the Exemplary Environmental Enterprise (E3) level or the Extraordinary Environmental Enterprise (E4) level? □ Yes ☑ No
- 28. Public Notice Information per 9 VAC 25-31-290: All pertinent information is on file, and may be inspected and copied by contacting Dawn Jeffries at: DEQ-Valley Regional Office, P.O. Box 3000, Harrisonburg, Virginia 22801, Telephone No. (540) 574-7892, dawn.jeffries@deq.virginia.gov.
 - Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.
- 29. Historical Record: An individual permit (VA0071846) for Endle ss Caverns to discharge treated domestic wastewater was issued October 25, 1999 and expired October 25, 2004 without renewal. The 1999 permit was tiered at 0.0046 MGD and 0.012 MGD. The treatment facility included a facultative lagoon, post aeration, and chlorination. The facility did discharge under the permit, but it was not renewed because the owners had begun using an on-site system for wastewater treatment in 2004 after a lagoon failure. In 2006, the new owner of the property applied for an individual permit since the intention was to expand the business, and the current on-site system was only capable of handling 2100 gpd. The permit (VA0071846) was issued 11/1/06 for a discharge to Smith Creek, UT at a flow of 0.039 MGD. In 2008, the permit was modified to change the outfall location to Smith Creek and include additional flow tiers of 0.010 MGD, 0.020 MGD, and 0.030 MGD.

APPENDIX A

DESCRIPTION OF TREATMENT WORKS TREATING DOMESTIC SEWAGE

The proposed treatment facility will serve the tourist attractions and campsites at Endless Caverns. The design average flow of the proposed treatment facility is 0.039 MGD. Below is a schematic of the proposed treatment facility:

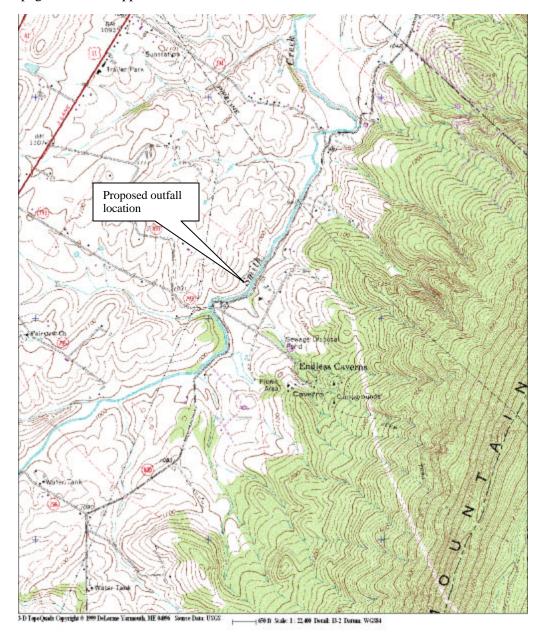


APPENDIX B

DISCHARGE LOCATION DESCRIPTION AND RECEIVING WATERS INFORMATION

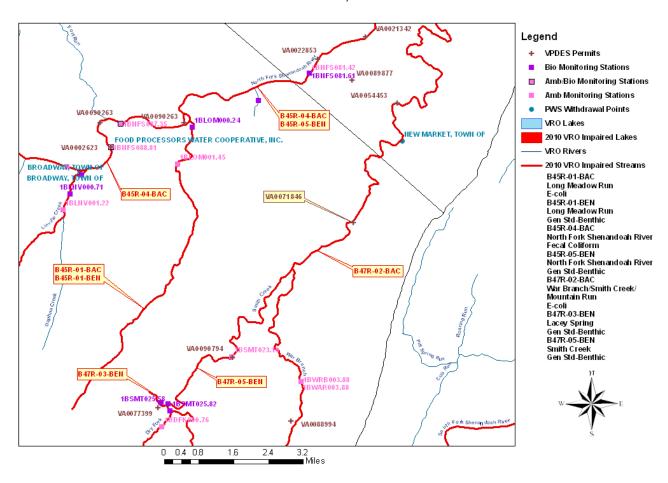
This facility discharges to the Smith Creek in Rockingham County. The location of Outfall 001 is shown on the topographic map below. Relevant points of interest within the watershed and in the vicinity of the discharge are shown on the Water Quality Assessment TMDL Review and corresponding map on pages 2-3 of this appendix.

Critical flows in the receiving stream at the discharge point are described in a Flow Frequency Determination that is presented on pages 4-5 of this appendix. Mixing zone predictions were performed using information specific to the discharge and receiving stream characteristics with the Agency's Virginia DEQ Mixing Zone Analysis Version 2.1 program. Annual average conditions were examined for each flow tier, and the results are presented on page 6-7 of this appendix.



	WA	TER QUALITY ASSESS	SMENTS REVIEW			
		TOMAC-SHENANDOA				
		3/30/2011				
		BADA IDED CEC	MENTE			
SEGMENT ID	STREAM	IMPAIRED SEG	SEGMENT END	SEGMENT LENGTH	PARAMETER	
B45R-01-BAC	Long Meadow Run	8.53	0.00	8.53	E-coli	
B45R-01-BEN	Long Meadow Run	8.53	0.00	8.53	Benthic	
B45R-04-BAC	North Fork Shenandoah River	92.61	60.75	31.86	Fecal Coliform	
B45R-05-BEN	North Fork Shenandoah River	87.92	76.11	11.81	Benthic	
B47R-02-BAC	Mountain Run/Smith Creek/War Branch	5.98, 33.83, 6.81	0.00, 0.00, 6.81	5.98, 33.83, 6.81	E-coli	
B47R-03-BEN	Lacey Spring	0.58	0.00	0.58	Benthic	
B47R-05-BEN	Smith Creek	25.19	0.00	25.19	Benthic	
DED ME	D. CW YEAV	PERMITS		7 A M	Y 0.V/G	WIDID
PERMIT	FACILITY	STREAM	RIVER MILE	LAT	LONG	WBID
VA0071846	Endless Caverns Inc	Smith Creek	17.24	383606	784049	VAV-B47F
VA0090263	Town of Broadway Regional WWTF-002		87.76	383809	784715	VAV-B45F
VA0002623	Food Processors Water Cooperative	N.F. Shenandoah River	88.82	383739	784659	VAV-B45F
VA0022853	New Market STP	N.F. Shenandoah River	80.91	383923	784141	VAV-B45F
VA0054453	New Market Poultry Products	Smith Creek	12.39	383829	783940	VAV-B47F
VA0077399	Lacey Spring Elementary School STP Mountain Valley KOA	Smith Creek X Trib War Branch	0.19	383225	784550	VAV-B47F
VA0088994 VA0089877	New Market Filtration Plant	N.F. Shen River X-Trib	4.45 0.95	383208 383857	784227 784049	VAV-B47F VAV-B45F
VA009977		Smith Creek	23.18	383325	784355	VAV-B45F
VA0090794 VA0090263	Mauzy Liberty Town of Broadway Regional WWTF-003		85.53	383808	784506	VAV-B47F VAV-B45F
VA0090203	Town of Broadway Regional WWTF-003	IV.F. Shehahudan Kivel	65.55	303000	764300	VAV-043N
		MONITORING ST	TATIONS			
STREAM	NAME	RIVER MILE	RECORD	LAT	LONG	
acey Springs	1BLAC000.14	0.14	08/08/00	383231	784545	
inville Creek	1BLNV000.71	0.71	04/25/91	383643	784802	
ong Meadow Run	1BLOM000.24	0.24	05/01/96	383802	784454	
I.F. Shenandoah River	1BNFS081.61	81.61	06/06/05	383906	784154	
Smith Creek	1BSMT025.58	25.58		383221	784532	
Smith Creek	1BSMT025.82	25.82		380313	791515	
Plains Mill Spring	1BXDX000.48	0.48	05/01/96	383834	784312	
inville Creek	1BLNV000.16	0.16		383706	784744	
I.F. Shenandoah River	1BNFS087.35	87.35	08/12/04	383808	784644	
I.F. Shenandoah River	1BNFS088.81	88.81	08/12/04	383739	784659	
Var Branch	1BWAR003.88	3.88	08/03/05	383255	784211	
inville Creek	1BLNV001.22	1.22	09/01/93	383624	784813	
I.F. Shenandoah River	1BNFS081.42	81.42	03/03/70	383906	784154	
I.F. Shenandoah River	1BNFS090.16	90.16	09/23/99	383717	784806	
Smith Creek	1BSMT023.18	23.1	07/01/91	383326	784356	
ong Meadow	1BLOM001.45	1.45	07/01/01	383718	-784517	
Var Branch	1BWRB003.88	3.88	7/2001	383255	-784211	
		PUBLIC WATER SUPP	LY INTAKES			
OWNER	STREAM	RIVER MILE				
IEW MARKET, TOWN O		14				
	WATER QUA	LITY MANAGEMENT	PLANNING REGU	LATION		
s this discharge addresse	ed in the WQMP regulation? No					
Yes, what effluent lim	itations or restrictions does the WQMP reg	ulation impose on this di	scharge?			
<u>PARAMETER</u>	ALLOCATION					
		WATERSHED	NAME			
		VAV-B47R Smith				

Endless Caverns STP - Water Quality Assessments Review March 30, 2011



MEMORANDUM DEPARTMENT OF ENVIRONMENTAL QUALITY

VALLEY REGIONAL OFFICE

4411 Early Road – P.O. Box 3000

Harrisonburg, VA 22801

SUBJECT: Flow Frequency Determination

Endless Caverns STP - VPDES Permit No. VA0071846, Rockingham County

TO: Permit Processing File

FROM: Dawn Jeffries

DATE: February 8, 2011

This memo supersedes Brandon Kiracofe's flow frequency determination dated June 6, 2006.

Endless Caverns STP is planned to discharge to Smith Creek near Tenth Legion, VA. Stream flow frequencies are required for Smith Creek just above the confluence with the UT for use by the permit writer in developing effluent limitations for the VPDES permit reissuance.

The flows in Smith Creek in the vicinity of Endless Caverns STP are influenced by Lacey Spring. Lacey Spring lies upstream of the gage and the STP. The VDEQ measured the spring flow once in August 1963 and on several occasions from 1981-1987 and from 1991-1993. The spring flow measurements were compared to the same day daily mean flows for Smith Creek as measured at the gage. The percentage of spring flow in Smith Creek was determined for each measurement and an average of the percentages was calculated. The average percent (21%) of spring flow in Smith Creek was then multiplied by the flow frequencies for the gage. The resulting values were considered to represent the flow frequencies for the spring. The values for Smith Creek above the UT were determined by subtracting the flow contributed by Lacey Spring from the flow frequencies for the Smith Creek gage and then performing a drainage area comparison. Once the flow frequencies were determined by the drainage area comparison, the Lacey Spring flows were then added back. The flow frequencies for the gage, Lacey Spring, Smith Creek minus the spring flow, and Smith Creek above the confluence with the UT that receives the Endless Caverns STP discharge are presented below. This analysis does not address any withdraws, discharges, or other springs between the gage and the confluence with the UT that receives the discharge.

Smith Creek near New Market, VA (#01632900):

	Drair	nage Area = 93.6 mi ²	
1Q30 =	4.7 cfs	High Flow 1Q10 =	13 cfs
1Q10 =	6.6 cfs	High Flow $7Q10 =$	15 cfs
7Q10 =	7.3 cfs	High Flow $30Q10 =$	18 cfs
30Q10 =	8.6 cfs	HM =	31 cfs
30Q5 =	11 cfs		

Refer to Table 1 for the percent of flow contributed to Smith Creek by Lacey Spring. Based on the flow data collected on Lacey Spring, it is estimated that the spring contributes 21% of the flow measured at the Smith Creek gage. Using 21% of the Smith gage flow frequencies, the flow frequencies for Lacey Spring are:

Lacey Spring:

]	Drainage <i>A</i>	Area = 0.47 mi^2 (at mouth)	
1Q30 =	0.99 cfs	High Flow $1Q10 =$	2.73 cfs
1Q10 =	1.70 cfs	High Flow 7Q10 =	3.15 cfs
7Q10 =	1.53 cfs	High Flow $30Q10 =$	3.78 cfs
30Q10 =	1.81 cfs	$\mathbf{HM} =$	6.51 cfs
3005 =	2.31 cfs		

Smith Creek minus Lacey Spring flow:

Using a drainage area comparison:

Smith Creek at the discharge point:

Adding back the Lacey Spring flow:

Smith Creek at the discharge point plus Lacey Spring flow:

Drainage Area = 71.9 mi ²							
1Q30 =	3.85 cfs	(2.49 MGD)	High Flow $1Q10 =$	10.6 cfs	(6.85 MGD)		
1Q10 =	5.48 cfs	(3.54 MGD)	High Flow $7Q10 =$	12.3 cfs	(7.95 MGD)		
7Q10 =	5.98 cfs	(3.86 MGD)	High Flow $30Q10 =$	14.8 cfs	(9.56 MGD)		
30Q10 =	7.05 cfs	(4.56 MGD)	$\mathbf{H}\mathbf{M} =$	25.4 cfs	(16.4 MGD)		
30Q5 =	9.02 cfs	(5.83 MGD)					

The high flow months are January through May.

Table 1
Percent of Flow Lacey Spring Contributes to Smith Creek

	Lacey Spring flow	Smith Creek flow	
Date	(cfs)	(cfs)	% of flow
Aug-63	6.78	16	42
5/29/81	4.466	91	4.9
10/26/83	8.3	41	20
4/18/84	11.85	304	3.9
10/16/84	6.812	26	26
4/18/85	4.31	39	11
9/30/85	3.12	10	31
4/24/86	5.928	65	9.1
11/5/86	1.75	15	12
4/13/87	8.14	112	7.3
11/9/87	5.19	28	19
4/4/91	7.57	128	5.9
10/9/91	5.33	13	41
4/23/92	27.9	335	8.3
9/29/92	10.67	27	40
4/28/93	26.91	192	14
9/23/93	12.03	22	55
		Average =	21

REVIEWER: KAS DATE: 2/8/11

EFFLUENT/STREAM MIXING EVALUATION

Mixing zone predictions were made for each flow tier with the Virginia DEQ Mixing Zone Analysis program. The predictions are based on the discharge and receiving stream characteristics, and are presented below.

Critical Annual Flow Mixing Conditions Effluent Flow = 0.010 MGD Stream 7Q10 = 3.86 MGD Stream 30Q10 = 4.56 MGD

Stream 1Q10 = 3.54 MGD Stream slope = 0.0019 ft/ft Stream width = 15 ft

Bottom scale = 2 Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .676 ft Length = 386.6 ft Velocity = .5905 ft/sec Residence Time = .0076 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .7499 ft Length = 352.37 ft Velocity = .6289 ft/sec Residence Time = .0065 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .641 ft Length = 405.18 ft Velocity = .5715 ft/sec Residence Time = .1969 hours

Recommendation: A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Critical Annual Flow Mixing Conditions

Effluent Flow = 0.020 MGD Stream 7Q10 = 3.86 MGD Stream 30Q10 = 4.56 MGD Stream 1Q10 = 3.54 MGD Stream slope = 0.0019 ft/ft Stream width = 15 ft Bottom scale = 2 Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .6773 ft Length = 385.91 ft Velocity = .5911 ft/sec Residence Time = .0076 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .751 ft Length = 351.91 ft Velocity = .6294 ft/sec Residence Time = .0065 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .6422 ft Length = 404.5 ft Velocity = .5721 ft/sec Residence Time = .1964 hours

Recommendation: A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Critical Annual Flow Mixing Conditions

Effluent Flow = 0.030 MGD Stream 7Q10 = 3.86 MGD Stream 30Q10 = 4.56 MGD Stream 1Q10 = 3.54 MGD Stream slope = 0.0019 ft/ft Stream width = 15 ft Bottom scale = 2

Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .676 ft Length = 387.36 ft Velocity = .5917 ft/sec Residence Time = .0076 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .752 ft Length = 351.49 ft Velocity = .6299 ft/sec Residence Time = .0065 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .6433 ft Length = 403.87 ft Velocity = .5727 ft/sec Residence Time = .1959 hours

Recommendation: A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Critical Annual Flow Mixing Conditions

Effluent Flow = 0.039 MGD Stream 7Q10 = 3.86 MGD Stream 30Q10 = 4.56 MGD Stream 1Q10 = 3.54 MGD Stream slope = 0.0019 ft/ft Stream width = 15 ft Bottom scale = 2 Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .6794 ft Length = 384.75 ft Velocity = .5922 ft/sec Residence Time = .0075 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .7529 ft Length = 351.11 ft Velocity = .6304 ft/sec Residence Time = .0064 days

Recommendation: A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .6443 ft Length = 403.34 ft Velocity = .5733 ft/sec Residence Time = .1954 hours

Recommendation: A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

MEMORANDUM DEPARTMENT OF ENVIRONMENTAL QUALITY

VALLEY REGIONAL OFFICE

4411 Early Road – P.O. Box 3000

Harrisonburg, VA 22801

SUBJECT: Site Visit for Reissuance of VPDES Permit No. VA0071846, Endless Caverns STP,

Rockingham County

TO: Permit Processing File

FROM: Dawn Jeffries

DATE: July 6, 2011

On July 6, 2011 the writer performed a site visit at the subject facility. The site visit included a visual inspection of the proposed outfall 001.





Outfall 001 Just below Outfall 001

APPENDIX C

EFFLUENT SCREENING AND EFFLUENT LIMITATIONS

EFFLUENT LIMITATIONS

A comparison of technology and water quality-based limits was performed, and the most stringent limits were selected. The selected limits are summarized in the table below.

Basis for Permit Limits

Outfall 001 - Permitted Flow Tier: 0.010 MGD

PARAMETER	BASIS FOR	EFFLUENT LIMITATIONS				MONITO REQUIREM	· -
TAKAMETEK	LIMITS	Month	ly Avg.	Weekly	Average	Frequency	Sample Type
Flow	4	N	L	NL		1/Day	Estimate
		Month	ly Avg.	Weekl	y Avg.		
BOD_5	1,3,5	30 mg/L	1.1 kg/d	45 mg/L	1.7 kg/d	1/Month	Grab
TSS	1	30 mg/L	1.1 kg/d	45 mg/L	1.7 kg/d	1/Month	Grab
Effluent Chlorine (TRC)*	3	2.0 r	ng/L	2.4 n	ng/L	1/Day	Grab
E. coli (geometric mean)	6	57 N/1	00 mL	N.	A	4/Month (10 am to 4 pm)	Grab
		Mini	mum	Maximum			
pН	3	6.5 S.U.		9.5 S.U.		1/Day	Grab
DO	2,3,5	5.0 mg/L		NA		1/Day	Grab
Contact Chlorine (TRC)*	2,3	1.5 r	ng/L	N.	A	1/Day	Grab

NL = No Limitation, monitoring required

Bases for Effluent Limitations

- 1. Federal Effluent Requirements (Secondary Treatment Regulation 40CFR133)
- 2. Best Professional Judgment (BPJ)
- 3. Water Quality Standards
- 4. VPDES Permit Regulation
- 5. Regional Stream Model (v 4.11)
- 6. Smith Creek TMDL Waste Load Allocation

NA = Not Applicable

^{4/}Month = 4 samples taken weekly during the calendar month

^{*} = Applicable only if chlorination is used for disinfection.

Basis for Permit Limits

Outfall 001 - Permitted Flow Tier: 0.020 MGD

PARAMETER	BASIS FOR	Е	EFFLUENT LIMITATIONS				RING MENTS
TAKAMLILK	LIMITS	Month	ly Avg.	Weekly	Average	Frequency	Sample Type
Flow	4	N	IL	NL		1/Day	Estimate
		Month	ly Avg.	Weekly Avg.			
BOD_5	1,3,5	30 mg/L	2.3 kg/d	45 mg/L	3.4 kg/d	1/Month	Grab
TSS	6	26 mg/L	2.0 kg/d	40 mg/L	3.1 kg/d	1/Month	Grab
Effluent Chlorine (TRC)*	3	1.5 r	ng/L	1.9 mg/L		1/Day	Grab
E. coli (geometric mean)	6	28 N/1	00 mL	N.	A	4/Month (10 am to 4 pm)	Grab
		Mini	mum	Maximum			
рН	3	6.5 S.U.		9.5 S.U.		1/Day	Grab
DO	2,3,5	5.0 mg/L		NA		1/Day	Grab
Contact Chlorine (TRC)*	2,3	1.5 r	ng/L	N.	A	1/Day	Grab

NL = No Limitation, monitoring required

NA = Not Applicable

Bases for Effluent Limitations

- 1. Federal Effluent Requirements (Secondary Treatment Regulation 40CFR133)
- 2. Best Professional Judgment (BPJ)
- 3. Water Quality Standards
- 4. VPDES Permit Regulation
- 5. Regional Stream Model (v 4.11)
- 6. Smith Creek TMDL Waste Load Allocation

^{4/}Month = 4 samples taken weekly during the calendar month

^{* =} Applicable only if chlorination is used for disinfection.

Basis for Permit Limits

Outfall 001 - Permitted Flow Tier: 0.030 MGD

PARAMETER	BASIS FOR	EFFLUENT LIMITATIONS				MONITO REQUIREM	· -
THUMBIER	LIMITS	Month	ly Avg.	Weekly Average		Frequency	Sample Type
Flow	4	N	IL	NL		1/Day	Estimate
		Month	ly Avg.	Weekl	y Avg.		
BOD_5	1,3,5	30 mg/L	3.4 kg/d	45 mg/L	5.1 kg/d	1/Month	Grab
TSS	6	17 mg/L	2.0 kg/d	27 mg/L	3.1 kg/d	1/Month	Grab
Effluent Chlorine (TRC)*	3	1.0 r	ng/L	1.2 n	ng/L	1/Day	Grab
E. coli (geometric mean)	6	19 N/1	00 mL	N.	A	4/Month (10 am to 4 pm)	Grab
		Mini	mum	Maxi	mum		
pН	3	6.5 S.U.		9.5 S.U.		1/Day	Grab
DO	2,3,5	5.0 mg/L		N.	A	1/Day	Grab
Contact Chlorine (TRC)*	2,3	1.5 r	ng/L	NA		1/Day	Grab

NL = No Limitation, monitoring required

Bases for Effluent Limitations

- 1. Federal Effluent Requirements (Secondary Treatment Regulation 40CFR133)
- 2. Best Professional Judgment (BPJ)
- 3. Water Quality Standards
- 4. VPDES Permit Regulation
- 5. Regional Stream Model (v 4.11)
- 6. Smith Creek TMDL Waste Load Allocation

^{4/}Month = 4 samples taken weekly during the calendar month

NA = Not Applicable

^{* =} Applicable only if chlorination is used for disinfection.

Basis for Permit Limits

Outfall 001 – Permitted Flow Tier: 0.039 MGD

PARAMETER	BASIS FOR	EFFLUENT LIMITATIONS				MONITO REQUIREM	
TAKAMLILK	LIMITS	Month	ly Avg.	Weekly	Average	Frequency	Sample Type
Flow	4	N	L	N	L	1/Day	Estimate
		Month	ly Avg.	Weekl	y Avg.		
BOD_5	1,3,5	30 mg/L	4.4 kg/d	45 mg/L	6.6 kg/d	1/Month	Grab
TSS	1	13 mg/L	2.0 kg/d	21 mg/L	3.1 kg/d	1/Month	Grab
Effluent Chlorine (TRC)*	3	0.80	mg/L	0.98 mg/L		1/Day	Grab
E. coli (geometric mean)	6	14 N/1	00 mL	N.	A	4/Month (10 am to 4 pm)	Grab
		Mini	mum	Maxi	mum		
рН	3	6.5 S.U.		9.5 S.U.		1/Day	Grab
DO	2,3,5	5.0 mg/L		NA		1/Day	Grab
Contact Chlorine (TRC)*	2,3	1.5 r	ng/L	N.	A	1/Day	Grab

NL = No Limitation, monitoring required

4/Month = 4 samples taken weekly during the calendar month

NA = Not Applicable

Bases for Effluent Limitations

- 1. Federal Effluent Requirements (Secondary Treatment Regulation 40CFR133)
- 2. Best Professional Judgment (BPJ)
- 3. Water Quality Standards (9 VAC 25-260)
- 4. VPDES Permit Regulation (9 VAC 25-31)
- 5. Regional Stream Model simulation
- 6. Smith Creek TMDL Waste Load Allocation

The following potential limiting factors have been considered in developing this permit and fact sheet:

Water Quality Management Plan Regulation (9 VAC 25-720)	
A. TMDL limits	TSS, E. coli
B. Non-TMDL WLAs	None
C. CBP (TN & TP) WLAs	Not applicable
Federal Effluent Guidelines	BOD ₅ , TSS, pH
BPJ/Agency Guidance limits	TRC (contact)
Water Quality-based Limits - numeric	BOD ₅ , DO, TRC (effluent), E. coli, pH, Ammonia-N
Water Quality-based Limits - narrative	None
Toxics Management Plan (TMP)	Not applicable
Storm Water Limits	Not applicable

^{* =} Applicable only if chlorination is used for disinfection.

EVALUATION OF THE EFFLUENT – CONVENTIONAL POLLUTANTS

Using the Regional Stream Model (v.4.11) it was determined that the following limits were protective at the 0.039 MGD flow tier. Because these limits are protective at the 0.039 MGD flow tier, they are also protective at the lower flow tiers.

 $cBOD_5 = 25 \text{ mg/L}$ TKN = 20 mg/LDO = 5 mg/L

Since the model indicated a CBOD₅ effluent concentration of 25 mg/L was protective, a BOD₅ limit of 30 mg/L was imposed in the permit. Per the Federal Secondary Treatment Regulations, these values are considered equal for this type of wastewater facility.

Based on the model, it was determined that no TKN limits were needed because a sewage treatment plant is not expected to discharge effluent with TKN concentrations greater than 20 mg/L.

The pH limits reflect the current Water Quality Standard for pH in the receiving stream.

EVALUATION OF THE EFFLUENT – DISINFECTION

The E. coli limits have been carried forward from the previous permit. These limits reflect the current WQS for E. coli in the receiving stream and comply with the TMDL WLA of 8.01 x 10⁹ cfu/yr. The WLA is based on a concentration of 126 cfu/100mL and a design flow of 0.0046 MGD. Chlorine limits are also specified in the permit, but are only applicable should the facility use chlorine disinfection. E. coli monitoring is required 4/Month to demonstrate compliance with the limit regardless of the disinfection method utilized. Due to the PWS designation for the receiving stream, the minimum chlorine level after the contact tank is 1.5 mg/L rather than 1.0 mg/L.

EVALUATION OF TMDL LIMITED PARAMETERS

Endless Caverns STP was assigned a TSS Waste Load Allocation (WLA) of 1641.6 lbs/yr in the Smith Creek TMDL. This annual allocation was converted to a loading of 2.04 kg/d and expressed in the permit as a monthly average loading limit 2.0 kg/d and weekly average load limit of 3.1 kg/d. Using these load allocations, concentrations for each flow were calculated as shown below. Values were expressed in the permit by rounding down to two significant figures in order to meet the load allocation and meet agency guidance on significant figures. Where concentration averages determined by the TMDL WLAs are greater than secondary limits required by federal regulation, secondary limits are imposed in the permit.

TSS

Flow	Monthly Average	Weekly Average
0.010 MGD	52.8 mg/L	81.9 mg/L
0.020 MGD	26.4 mg/L	40.9 mg/l
0.030 MGD	17.6 mg/L	27.3 mg/L
0.039 MGD	13.5 mg/L	21.0 mg/L

Endless Caverns STP was also assigned an E. coli WLA of 8.01*10° cfu/year in the Smith Creek TMDL. This annual allocation was converted to concentrations for each flow tier as shown below and expressed in the permit as a geometric mean by rounding down to two significant figures in order to meet the load allocation and meet agency guidance on significant figures.

E.coli

Flow	Monthly Geometric Mean
0.010 MCD	1,10011
0.010 MGD	57.9 cfu/100 mL
0.020 MGD	28.9 cfu/100 mL
0.030 MGD	19.3 cfu/100 mL
0.039 MGD	14.9 cfu/100 mL

EVALUATION OF THE EFFLUENT – NUTRIENTS

N/A. Facility to discharge <40,000 gallons per day and did discharge from the site prior to December 31, 2010.

EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS

Receiving Stream Data

Water quality data for the receiving stream was obtained from Ambient Monitoring Station No. 1BSMT023.18 on Smith Creek. (See Table 1 below). A Flow Frequency Determination for the receiving stream is included in Appendix B.

Stream Parameter	Value	Units
Mean Hardness (as CaCO ₃) =	230	mg/L
90 th Percentile Temperature (Annual) =	20	°C
90 th Percentile Temperature (Wet season*) =	14	°C
90 th Percentile Maximum pH =	8.4	SU
10 th Percentile Maximum pH =	7.5	SU

Effluent Data

Because this is a proposed facility and there are no site specific effluent data, the effluent values shown in Table 2 below were utilized per BPJ.

Effluent Parameter	Value	Units
Mean Hardness (as CaCO ₃) =	150	mg/L
90 th Percentile Temperature (Annual) =	25	°C
90 th Percentile Temperature (Wet season*) =	15	°C
90 th Percentile Maximum pH =	7.5	SU
10 th Percentile Maximum pH =	7.0	SU

^{*} Wet Season = January through May

WQC and WLAs were calculated for the WQS parameters and are presented below. Because the WLAs for Ammonia-N at the highest flow did not indicate a limit, statistical analyses of the lower flow tiers for Ammonia-N were not necessary. Those WQC and WLAs are presented in this appendix. Current agency guidelines recommends the evaluation of toxic pollutant limits for TRC and Ammonia-N based on default effluent concentrations of 20 mg/L and 9 mg/L, respectively. The effluent data were analyzed per the protocol for evaluation of effluent toxic pollutants included in this appendix with the following results:

- TRC: Monthly average and maximum weekly average limits are required for this discharge. These limits are identical to current limits.
- Ammonia-N: No limits were determined to be necessary for Ammonia-N at any permitted tier.

Facility Name:		WATER QUALITY C	RITERIA / V	VASTE LOAD	ALLOCATION	ANALYSI	S	
Endless Caverns STP Receiving Stream:		Permi	t No.: VA007	1846				
Smith Creek			Date: 3/30/2	011			Version: OWP Guidance Memo 00-2011 (8/2	24/00)
Stream Information		Stream Flows		Mixing Inform	ation		Effluent Information	
Mean Hardness (as CaCO3) =	230 mg/L	1Q10 (Annual) =	3.54 MGD	Annual	- 1Q10 Flow =	100 %	Mean Hardness (as CaCO3) =	150 mg/L
90% Temperature (Annual) =	20 deg C	7Q10 (Annual) =	3.86 MGD		- 7Q10 Flow =	100 %	90% Temp (Annual) =	25 deg C
90% Temperature (Wet season) =	1 4 deg C	30Q10 (Annual) =	4.56 MGD		- 30Q10 Flow =	100 %	90% Temp (Wet season) =	15 deg C
90% Maximum pH =	8.4 SU	1Q10 (Wet season) =	6.85 MGD	Wet Season	- 1Q10 Flow =	%	90% Maximum pH =	7.5 SU
10% Maximum pH =	7.5 SU	30Q10 (Wet season) =	9.56 MGD		- 30Q10 Flow =	%	10% Maximum pH =	7.0 SU
Tier Designation =	1	30Q5 =	5.83 MGD				Current Discharge Flow =	0.000 MGD
Public Water Supply (PWS) Y/N? =	Υ	Harmonic Mean =	16.4 MGD				Discharge Flow for Limit Analysis =	0.010 MGD
V(alley) or P(iedmont)? =	V							
Trout Present Y/N? =	N							
Early Life Stages Present Y/N? =	Υ							
Footnotes:								
 All concentrations expressed as micrograms/liter 		otherwise.			oad Allocation (based or			
2. All flow values are expressed as Million Gallons					d on mass balances (les			
 Discharge volumes are highest monthly average Hardness expressed as mg/l CaCO3. Standards 			•		avg. concentration not to		re tnan 1/3 years. onia) not to be exceeded more than 1/3 years.	
 Public Water Supply" protects for fish & water o 							ic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcino	igens.
Carcinogen "Y" indicates carcinogenic paramete							oyed are a function of the mixing analysis and may be less t	
Ammonia WQSs selected from separate tables,		mperature.					inimum WLA and EPA's statistical approach (Technical Sup	
8. Metals measured as Dissolved, unless specified	otherwise.							
9. WLA = Waste Load Allocation (based on standa	rds).							

Facility Name:	Permit No.:
Endless Caverns STP	VA0071846
Receiving Stream:	Date:
Smith Creek	3/30/2011

Toxic Parameter and Form	Carcinogen?
Ammonia-N (Annual)	N
Chlorine. Total Residual	N

POST - DISCHARGE WATER QUALITY CRITERIA

0.010 MGD Discharge Flow - Mix per "Mixer"

		питпа	пеаш
Aquatic Pro	tection	Public Water	Other Surface
Acute	Chronic	Supplies	Waters
3.9E+00 mg/L	9.2E-01 mg/L	None	None
1.9E-02 mg/L	1.1E-02 mg/L	None	None

NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS

_	0.010 MGD Discharge - Mix per "Mixer"						
_	Aquatic Prote	ection	Human				
	Acute	Chronic	Health				
	1.4E+03 mg/L	4.2E+02 mg/L	N/A				
	6.7E+00 mg/L	4.3E+00 mg/L	N/A				

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name: **Endless Caverns STP**

Receiving Stream: Permit No.: VA0071846 Date: 3/30/2011 Smith Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Inform	nation		Effluent Information	
Mean Hardness (as CaCO3) =	230 mg/L	1Q10 (Annual) =	3.54 MGD	Annual	- 1Q10 Flow =	100 %	Mean Hardness (as CaCO3) =	150 mg/L
90% Temperature (Annual) =	20 deg C	7Q10 (Annual) =	3.86 MGD		- 7Q10 Flow =	100 %	90% Temp (Annual) =	25 deg (
90% Temperature (Wet season) =	14 deg C	30Q10 (Annual) =	4.56 MGD		- 30Q10 Flow =	100 %	90% Temp (Wet season) =	15 deg (
90% Maximum pH =	8.4 SU	1Q10 (Wet season) =	6.85 MGD	Wet Season	- 1Q10 Flow =	%	90% Maximum pH =	7.5 SU
10% Maximum pH =	7.5 SU	30Q10 (Wet season) =	9.56 MGD		- 30Q10 Flow =	%	10% Maximum pH =	7.0 SU
Tier Designation =	1	30Q5 =	5.83 MGD				Current Discharge Flow =	0.000 MGD
Public Water Supply (PWS) Y/N? =	Υ	Harmonic Mean =	16.4 MGD				Discharge Flow for Limit Analysis =	0.020 MGD
V(alley) or P(iedmont)? =	V							
Trout Present Y/N? =	N							
Early Life Stages Present Y/N? =	Υ							

- 1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise.
- 2. All flow values are expressed as Million Gallons per Day (MGD).
- 3. Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipals.
- Hardness expressed as mg/l CaCO3. Standards calculated using Hardness values in the range of 25-400 mg/l CaCO3.
 "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.

Carcinogen?

Ν

Ν

- Carcinogen "Y" indicates carcinogenic parameter.
 Ammonia WQSs selected from separate tables, based on pH and temperature
- 8. Metals measured as Dissolved, unless specified otherwise
- 9. WLA = Waste Load Allocation (based on standards).

- WLA = Waste Load Allocation (based on standards).
- WLAs are based on mass balances (less background, if data exist).
- 12. Acute 1 hour avg. concentration not to be exceeded more than 1/3 years.
- Chronic 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years.
 Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens.
- and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual flows 15. Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

Facility Name:	Permit No.:
Endless Caverns STP	VA0071846
Receiving Stream:	Date:
Smith Creek	3/30/2011

POST - DISCHARGE WATER QUALITY CRITERIA

0.020 MGD Discharge Flow - Mix per "Mixer"

			Human	Health
Aquatic Protection			Public Water	Other Surface
Acute	Chronic		Supplies	Waters
4.0E+00 mg/L	9.2E-01 i	mg/L	None	None
1.9E-02 mg/L	1.1E-02 I	mg/L	None	None

NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS

0.020 MGD Discharge - Mix per "Mixer"

Aquatic Prote	ection	Human
Acute	Chronic	Health_
7.1E+02 mg/L	2.1E+02 mg/L	N/A
3.4E+00 mg/L	2.1E+00 mg/L	N/A

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name:

Toxic Parameter and Form

Ammonia-N (Annual)

Chlorine. Total Residual

Endless Caverns STP Receiving Stream:

Permit No.: VA0071846 Version: OWP Guidance Memo 00-2011 (8/24/00) Smith Creek Date: 3/30/2011

Stream Information		Stream Flows		Mixing Inform	ation		Effluent Information	
Mean Hardness (as CaCO3) =	230 mg/L	1Q10 (Annual) =	3.54 MGD	Annual	- 1Q10 Flow =	100 %	Mean Hardness (as CaCO3) =	150 mg/L
90% Temperature (Annual) =	20 deg C	7Q10 (Annual) =	3.86 MGD		- 7Q10 Flow =	100 %	90% Temp (Annual) =	25 deg C
90% Temperature (Wet season) =	14 deg C	30Q10 (Annual) =	4.56 MGD		- 30Q10 Flow =	100 %	90% Temp (Wet season) =	15 deg C
90% Maximum pH =	8.4 SU	1Q10 (Wet season) =	6.85 MGD	Wet Season	- 1Q10 Flow =	%	90% Maximum pH =	7.5 SU
10% Maximum pH =	7.5 SU	30Q10 (Wet season) =	9.56 MGD		- 30Q10 Flow =	%	10% Maximum pH =	7.0 SU
Tier Designation =	1	30Q5 =	5.83 MGD				Current Discharge Flow =	0.000 MGD
Public Water Supply (PWS) Y/N? =	Υ	Harmonic Mean =	16.4 MGD				Discharge Flow for Limit Analysis =	0.030 MGD
V(alley) or P(iedmont)? =	V							
Trout Present Y/N? =	N							
Early Life Stages Present Y/N? =	Υ							

Toxic Parameter and Form

Ammonia-N (Annual)

Chlorine. Total Residual

- 1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- All flow values are expressed as Million Gallons per Day (MGD).
 Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipals.
- 4. Hardness expressed as mg/l CaCO3. Standards calculated using Hardness values in the range of 25-400 mg/l CaCO3.

 5. "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.

Carcinogen?

Ν

Ν

- Carcinogen "Y" indicates carcinogenic parameter.
- 7. Ammonia WQSs selected from separate tables, based on pH and temperature
- 8. Metals measured as Dissolved, unless specified otherwise
- 9. WLA = Waste Load Allocation (based on standards).

- 10. WLA = Waste Load Allocation (based on standards).
- 11. WLAs are based on mass balances (less background, if data exist).12. Acute 1 hour avg. concentration not to be exceeded more than 1/3 years.
- 13. Chronic 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years
- Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens. and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual flows
- 15. Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

Facility Name: Permit No.: **Endless Caverns STP** VA0071846 Receiving Stream: Date: Smith Creek 3/30/2011

POST - DISCHARGE WATER QUALITY CRITERIA

0.030 MGD Discharge Flow - Mix per "Mixer"

			Human	Health
Aquatic Pro		Public Water	Other Surface	
Acute	Chronic		Supplies	<u>Waters</u>
4.1E+00 mg/L	9.3E-01	mg/L	None	None
1.9E-02 mg/L	1.1E-02	mg/L	None	None

NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS

0.030 MGD Discharge - Mix per "Mixer"

Aquatic Prote	ction	Human
Acute	Chronic	Health
4.8E+02 mg/L	1.4E+02 mg/L	N/A
2.3E+00 mg/L	1.4E+00 mg/L	N/A

WATER QUALITY CRITERIA / WASTE LOAD ALLOCATION ANALYSIS

Facility Name:

Endless Caverns STP Receiving Stream:

Permit No.: VA0071846 Date: 3/30/2011 Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Inform	ation		Effluent Information	
Mean Hardness (as CaCO3) =	230 mg/L	1Q10 (Annual) =	3.54 MGD	Annual	- 1Q10 Flow =	100 %	Mean Hardness (as CaCO3) =	150 mg/L
90% Temperature (Annual) =	20 deg C	7Q10 (Annual) =	3.86 MGD		- 7Q10 Flow =	100 %	90% Temp (Annual) =	25 deg C
90% Temperature (Wet season) =	14 deg C	30Q10 (Annual) =	4.56 MGD		- 30Q10 Flow =	100 %	90% Temp (Wet season) =	15 deg C
90% Maximum pH =	8.4 SU	1Q10 (Wet season) =	6.85 MGD	Wet Season	- 1Q10 Flow =	%	90% Maximum pH =	7.5 SU
10% Maximum pH =	7.5 SU	30Q10 (Wet season) =	9.56 MGD		- 30Q10 Flow =	%	10% Maximum pH =	7.0 SU
Tier Designation =	1	30Q5 =	5.83 MGD				Current Discharge Flow =	0.000 MGD
Public Water Supply (PWS) Y/N? =	Υ	Harmonic Mean =	16.4 MGD				Discharge Flow for Limit Analysis =	0.039 MGD
V(alley) or P(iedmont)? =	V							
Trout Present Y/N? =	N							
Early Life Stages Present Y/N? =	Υ							

Footnotes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise.
 All flow values are expressed as Million Gallons per Day (MGD).
- 3. Discharge volumes are highest monthly average or 2C maximum for Industries and design flows for Municipals.
- Hardness expressed as mg/l CaCO3. Standards calculated using Hardness values in the range of 25-400 mg/l CaCO3.
 "Public Water Supply" protects for fish & water consumption. "Other Surface Waters" protects for fish consumption only.

- Carcinogen "Y" indicates carcinogenic parameter.
 Ammonia WQSs selected from separate tables, based on pH and temperature.
- Metals measured as Dissolved, unless specified otherwise.
 WLA = Waste Load Allocation (based on standards).

- 10. WLA = Waste Load Allocation (based on standards).
- WLAs are based on mass balances (less background, if data exist).
 Acute 1 hour avg. concentration not to be exceeded more than 1/3 years.
- Chronic 4 day avg. concentration (30 day avg. for Ammonia) not to be exceeded more than 1/3 years.
 Mass balances employ 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens,
- and Harmonic Mean for Carcinogens. Actual flows employed are a function of the mixing analysis and may be less than the actual flows 15. Effluent Limitations are calculated elsewhere using the minimum WLA and EPA's statistical approach (Technical Support Document).

Facility Name:	Permit No.:
Endless Caverns STP	VA0071846
Receiving Stream:	Date:
Smith Creek	3/30/2011

Toxic Parameter and Form

Ammonia-N (Annual) Chlorine. Total Residual

POST - DISCHARGE WATER QUALITY CRITERIA

0.039 MGD Discharge Flow - Mix per "Mixer"

3/30/2011			пита	i neaith
	Aquatic Pro	tection	Public Water	Other Surface
Carcinogen?	Acute	Chronic	Supplies	Waters
N	4.1E+00 mg/L	9.4E-01 mg/L	None	None
N	1.9E-02 mg/L	1.1E-02 mg/L	None	None

NON-ANTIDEGRADATION WASTE LOAD ALLOCATIONS

0.039 MGD Discharge - Mix per "Mixer"

Aquatic Prote	ection	Human
Acute	Chronic	Health
3.8E+02 mg/L	1.1E+02 mg/L	N/A
1.7E+00 mg/L	1.1E+00 mg/L	N/A

PROTOCOL FOR THE EVALUATION OF THE EFFLUENT – TOXIC POLLUTANTS

Toxic pollutants were evaluated in accordance with OWP Guidance Memo No. 00-2011. According to this guidance, STPs with a design flow = 0.040 MGD are treated as if there are no toxic pollutants in their discharge unless there is actual evidence to indicate otherwise. This applies to all toxic pollutants with the exception of Ammonia and Total Residual Chlorine, which are evaluated in every STP discharge. Also, these smaller STPs are not required to monitor for any toxic pollutants unless there is reason to believe that such pollutants may be present.

Acute and Chronic Waste Load Allocations (WLA $_a$ and WLA $_c$) were analyzed according to the protocol below using a statistical approach (STAT.exe) to determine the necessity and magnitude of limits. Human Health Waste Load Allocations (WLA $_{hh}$) were analyzed according to the same protocol through a simple comparison with the effluent data. If the WLA $_{hh}$ exceeded the effluent datum or data mean, no limits were required. If the effluent datum or data mean exceeded the WLA $_{hh}$, the WLA $_{hh}$ was imposed as the limit.

Since there are no data available for any toxic pollutants immediately upstream of this discharge, all upstream background pollutant concentrations are assumed to be "0".

The steps used in evaluating available effluent data from STPs with design flows = 0.040 MGD are as follows:

- A. If all data are reported as "below detection" or < the required Quantification Level (QL) (or, for metals, in a form other than "dissolved"), then the data are not suitable for analysis and no further monitoring is required.
- B. If any data value is reported as detectable at or above the required QL, then the data are adequate to determine whether effluent limits are needed.
 - B.1. If the evaluation indicates that no limits are needed, then no further monitoring is required.
 - B.2. If the evaluation indicates that limits are needed, then the limits and associated requirements are specified in the draft permit.

Parameter	CASRN	QL	Data	Source of Data	Data Eval
Ammonia-N (mg/L) (Annual)	766-41-7	0.2 mg/L	Default = 9 mg/L	a	B.1
Ammonia-N (mg/L) (Wet Season)	766-41-7	0.2 mg/L	Default = 9 mg/L	a	B.1
TRC (mg/L)	7782-50-5	0.1 mg/L	Default = 20 mg/L	a	B.2

CASRN = Chemical Abstract Service Registry Number for each parameter is referenced in the current Water Quality Standards. A unique numeric identifier designating only one substance. The Chemical Abstract Service is a division of the American Chemical Society.

"Source of Data" codes:

- $a = default \ effluent \ concentration$
- b = data from permittee monitoring

"Data Evaluation" codes:

See section titled PROTOCOL FOR THE EVALUATION OF EFFLUENT TOXIC POLLUTANTS for an explanation of the code used.

STAT.EXE Results

<u>Total Residual Chlorine – 0.010 MGD</u> **Total Residual Chlorine 0.020 MGD** Facility = Endless Caverns STP Facility = Endless Caverns STP Chemical = TRC Chemical = TRC Chronic averaging period = 4Chronic averaging period = 4 WLAa = 4*WLAa = 3.4WLAc = 4*WLAc = 2.1Q.L. = 0.1Q.L. = 0.1# samples/mo. = 30# samples/mo. = 30# samples/wk. = 7 # samples/wk. = 7 Summary of Statistics: Summary of Statistics: # observations = 1 # observations = 1 Expected Value = 20 Expected Value = 20 Variance = 144 Variance = 144 C.V. = 0.6C.V. = 0.697th percentile daily values = 48.6683 97th percentile daily values = 48.668397th percentile 4 day average = 33.2758 97th percentile 4 day average = 33.2758 97th percentile 30 day average= 24.1210 97th percentile 30 day average= 24.1210 # < Q.L. = 0# < Q.L. = 0Model used = BPJ Assumptions, type 2 data Model used = BPJ Assumptions, type 2 data A limit is needed based on Acute Toxicity A limit is needed based on Chronic Toxicity Maximum Daily Limit = 4Maximum Daily Limit = 3.07140704651179Average Weekly Limit = 2.44282882700811 Average Weekly Limit = 1.87573041817371 Average Monthly Limit = 1.98248465547072 Average Monthly Limit = 1.52225433510356 The data are: 20 The data are: 20 *Per the GM No. 00-2011, if the WLAa > 4.0, run Stat.exe with inputs of WLAa = 4.0, WLAc = 4.0<u>Total Residual Chlorine – 0.039 MGD</u> <u>Total Residual Chlorine – 0.030 MGD</u> Facility = Endless Caverns STP Facility = Endless Caverns Chemical = TRCChemical = TRC Chronic averaging period = 4 Chronic averaging period = 4 WLAa = 2.3WLAa = 1.7WLAc = 1.4WLAc = 1.1Q.L. = 0.1O.L. = 0.1# samples/mo. = 30# samples/mo. = 30# samples/wk. = 7 # samples/wk. = 7 Summary of Statistics: Summary of Statistics: # observations = 1 # observations = 1 Expected Value = 20 Expected Value = 20Variance = 144 Variance = 144 C.V. = 0.6= 0.697th percentile daily values = 48.668397th percentile daily values = 48.668397th percentile 4 day average = 33.2758 97th percentile 4 day average = 33.2758 97th percentile 30 day average= 24.1210 97th percentile 30 day average= 24.1210 # < O.L. = 0# < O.L. = 0Model used = BPJ Assumptions, type 2 data Model used = BPJ Assumptions, type 2 data A limit is needed based on Chronic Toxicity A limit is needed based on Chronic Toxicity Maximum Daily Limit = 2.04760469767452Maximum Daily Limit = 1.60883226245855 Average Weekly Limit = 1.25048694544914 Average Weekly Limit = 0.98252545713861 Average Monthly Limit = 1.01483622340237 Average Monthly Limit = 0.79737131838758 The data are: 20 The data are: 20

$\underline{Ammonia\text{-}N-0.039\ MGD}$

Facility = Endless Caverns
Chemical = Ammonia-N (Annual)
Chronic averaging period = 30
WLAa = 380
WLAc = 110
Q.L. = 0.2
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average = 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

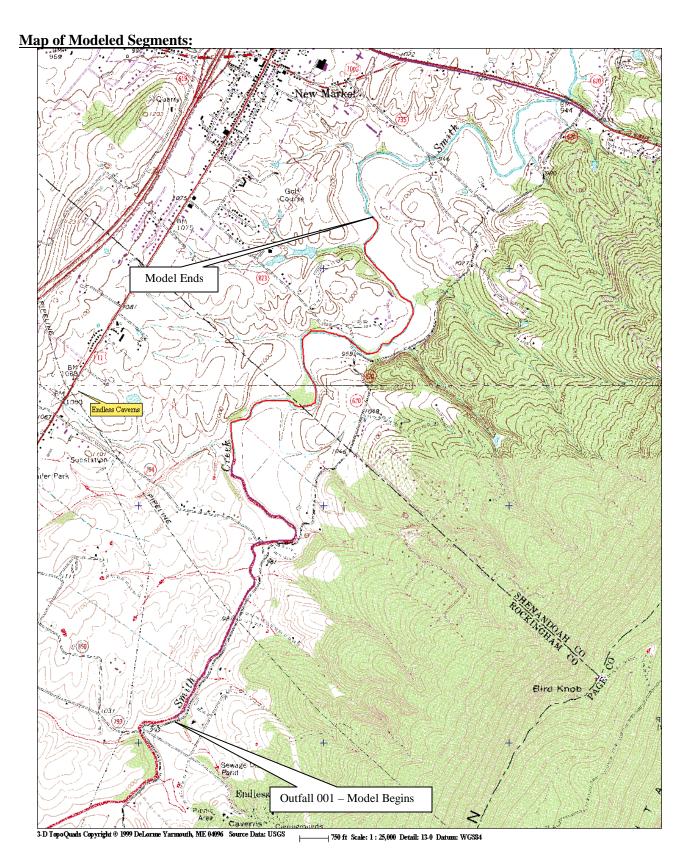
The data are: 9

Regional Stream Modeling Information

Segmentation and General Discussion:

Segment#	Starts at:	Elev. (ft)	Length (mi)	Inputs	Comments
1	Endless Caverns STP	980	4.0	Design Flow = 0.039 MGD $cBOD_5 = 25 \text{ mg/L}$ TKN = 20 mg/L DO = 5 mg/L $Temp = 25 ^{\circ}\text{C}$	
Model ends		940			

The model ends at the water intake point for New Market on Smith Creek approximately 4 miles from the discharge. Extending the model beyond this point was not deemed necessary because both the $cBOD_u$ and DO concentrations had reached background levels and further assimilation of $nBOD_u$ was not occurring.



Modeling Input Data:

File Information

File Name:

U:\WATER PERMITS\DRAFT PERMITS\Endless Caverns\0.039 MGD

Date Modified: June 15, 2011

Water Quality Standards Information

Stream Name: SMITH CREEK

River Basin: Potomac/Shenandoah Rivers Basin

Section: 6e

Class: IV - Mountainous Zones Waters

Special Standards: pH, PWS

Background Flow Information

Gauge Used: FFD, 2/8/11

Gauge Drainage Area: 71.9 Sq.Mi. Gauge 7Q10 Flow: 3.86 MGD Headwater Drainage Area: 71.9 Sq.Mi.

Headwater 7Q10 Flow: 3.86 MGD (Net; includes Withdrawals/Discharges)

Withdrawal/Discharges: 0 MGD

Incremental Flow in Segments: 5.368567E-02 MGD/Sq.Mi.

Background Water Quality

Background Temperature: 20 Degrees C

Background cBOD5: 2 mg/l Background TKN: 0 mg/l Background D.O.: 7.906135 mg/l

Model Segmentation

Number of Segments: 1

Model Start Elevation: 980 ft above MSL Model End Elevation: 940 ft above MSL Segment Information for Segment 1

Definition Information

Segment Definition: A discharge enters.
Discharge Name: ENDLESS CAVERNS STP

VPDES Permit No.: VA0071846

Discharger Flow Information

Flow: 0.039 MGD cBOD5: 25 mg/l TKN: 20 mg/l D.O.: 5 mg/l

Temperature: 25 Degrees C

Geographic Information

Segment Length: 4 miles

Upstream Drainage Area: 71.9 Sq.Mi. Downstream Drainage Area: 71.9 Sq.Mi.

Upstream Elevation: 980 Ft. Downstream Elevation: 940 Ft.

Hydraulic Information

Segment Width: 15 Ft. Segment Depth: 0.609 Ft. Segment Velocity: 0.664 Ft./Sec. Segment Flow: 3.899 MGD

Incremental Flow: 0 MGD (Applied at end of segment.)

Channel Information

Cross Section: Wide Shallow Arc Character: Moderately Meandering

Pool and Riffle: Yes Percent Pools: 10 Percent Riffles: 90 Pool Depth: 1.5 Ft. Riffle Depth: 0.5 Ft. Bottom Type: Sand Sludge: None

Plants: None Algae: None

Model Output:

Model is for SMITH CREEK.

Model starts at the ENDLESS CAVERNS STP discharge.

Background Data

7Q10	"cBOD5"	"TKN"	"DO"	"Temp"
(mgd)	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
3.86	2	0	7.906	20

Discharge/Tributary Input Data for Segment 1

Flow	"cBOD5"	"TKN"	"DO"	"Temp"
(mgd)	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
0.039	25	20	5	25

Hydraulic Information for Segment 1

Length	Width	"Depth"	"Velocity"
(mi)	"(ft)"	"(ft)"	"(ft/sec)"
4	15	0.609	0.664

Initial Mix Values for Segment 1

Flow	"DO"	"cBOD"	"nBOD"	"DOSat"	"Temp"
(mgd)	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
3.899	7.877	5.575	0.736	8.783	20.05001

Rate Constants for Segment 1. - (All units Per Day)

k1	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
0.3	0.301	6	6.007	0.05	0.05	0	0

Output for Segment 1

Segment starts at ENDLESS CAVERNS STP

Total	"Segm."			
Dist.	"Dist."	"DO"	"cBOD"	"nBOD"
(mi)	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0	0	7.877	5.575	0.736
0.1	0.1	7.904	5.56	0.736
0.2	0.2	7.904	5.545	0.736
0.3	0.3	7.904	5.53	0.736
0.4	0.4	7.904	5.515	0.736
0.5	0.5	7.904	5.5	0.736
0.6	0.6	7.904	5.485	0.736
0.7	0.7	7.904	5.47	0.736

Fact Sheet - VPDES Permit No. VA0071846 - Endless Caverns STP

0.8	0.8	7.904	5.455	0.736
0.9	0.9	7.904	5.44	0.736
1	1	7.904	5.425	0.736
1.1	1.1	7.904	5.41	0.736
1.2	1.2	7.904	5.395	0.736
1.3	1.3	7.904	5.38	0.736
1.4	1.4	7.904	5.365	0.736
1.5	1.5	7.904	5.35	0.736
1.6	1.6	7.904	5.335	0.736
1.7	1.7	7.904	5.32	0.736
1.8	1.8	7.904	5.305	0.736
1.9	1.9	7.904	5.29	0.736
2	2	7.904	5.275	0.736
2.1	2.1	7.904	5.26	0.736
2.2	2.2	7.904	5.245	0.736
2.3	2.3	7.904	5.231	0.736
2.4	2.4	7.904	5.217	0.736
2.5	2.5	7.904	5.203	0.736
2.6	2.6	7.904	5.189	0.736
2.7	2.7	7.904	5.175	0.736
2.8	2.8	7.904	5.161	0.736
2.9	2.9	7.904	5.147	0.736
3	3	7.904	5.133	0.736
3.1	3.1	7.904	5.119	0.736
3.2	3.2	7.904	5.105	0.736
3.3	3.3	7.904	5.091	0.736
3.4	3.4	7.904	5.077	0.736
3.5	3.5	7.904	5.063	0.736
3.6	3.6	7.904	5.049	0.736
3.7	3.7	7.904	5.035	0.736
3.8	3.8	7.904	5.021	0.736
3.9	3.9	7.904	5.007	0.736
4	4	7.904	5	0.736

END OF FILE

APPENDIX D

PERMIT CHANGES AND BASES FOR SPECIAL CONDITIONS

Tabulated below are the sections of the permit, with any changes and the reasons for the changes identified. Also provided is the basis for each of the permit special conditions.

- Cover Page Content and format as prescribed by the VPDES Permit Manual.
- Part I.A.1. **Effluent Limitations and Monitoring Requirements:** Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual. *Updates Part I.A.1. of the previous permit with the following:*
 - Slight changes to introductory language.
 - E.coli monitoring frequency changed from 1/week to 4/month.
- Part I.A.2. **Effluent Limitations and Monitoring Requirements:** Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual. *Updates Part I.A.2. of the previous permit with the following:*
 - Slight changes to introductory language.
 - E.coli monitoring frequency changed from 1/week to 4/month.
- Part I.A.3. **Effluent Limitations and Monitoring Requirements:** Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual. *Updates Part I.A.3. of the previous permit with the following:*
 - Slight changes to introductory language.
 - Monitoring frequency for TSS changed from 1/week to 1/month.
 - E.coli monitoring frequency changed from 1/week to 4/month.
- Part I.A.4. **Effluent Limitations and Monitoring Requirements:** Bases for effluent limits provided in previous pages of this fact sheet. Monitoring requirements as prescribed by the VPDES Permit Manual.

Updates Part I.A.4. of the previous permit with the following:

- Slight changes to introductory language.
- Monitoring frequency for TSS changed from 1/week to 1/month.
- E.coli monitoring frequency changed from 1/week to 4/month.
- Part I.B. **Total Residual Chlorine (TRC) Effluent Limitations and Monitoring Requirements:** *Updates Part I.B. of the previous permit.* Specifies both disinfection and effluent limits and monitoring requirements should the permittee elect to switch from alternate disinfection to chlorine disinfection. Required by Sewage Collection and Treatment (SCAT) Regulations and 9 VAC 25-260-170, Bacteria; other waters. Also, 40 CFR 122.41(e) requires the permittee, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. This ensures proper operation of chlorination equipment to maintain adequate disinfection.
- Part I.C. **Effluent Limitations and Monitoring Requirements Additional Instructions:** *Updates Part I.C. of the previous permit.* Authorized by VPDES Permit Regulation, 9 VAC 25-31-190 J 4 and 220 I. This condition is necessary when a maximum level of quantification and/or a specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. The condition also establishes protocols for calculation of reported values.

- Part I.D.1. **95% Capacity Reopener:** *Identical to Part I.D.1. of the previous permit.* Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 4 for certain permits.
- Part I.D.2. **Materials Handling/Storage:** *Identical to Part I.D.2. of the previous permit.* 9 VAC 25-31-280.B.2. requires that the types and quantities of "wastes, fluids, or pollutants which are ... treated, stored, etc." be addressed for all permitted facilities.
- Part I.D.3. **O&M Manual Requirement:** *Updates Part I.D.3. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs. Added requirement to describe procedures for documenting compliance with the permit requirement that there shall be no discharge of floating solids or visible foam in other than trace amounts.
- Part I.D.4. **CTC/CTO Requirement:** *Identical to Part I.D.4. of the previous permit.* Required by Code of Virginia 62.1-44.19, SCAT Regulations 9 VAC 25-790, and VPDES Permit Regulation 9 VAC 25-31-190 E for all STPs.
- Part I.D.5. **SMP Requirement:** *Updates Part I.D.6. of the previous permit.* VPDES Permit Regulation 9 VAC 25-31-100 P, 220 B 2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements are derived from the Virginia Pollution Abatement Permit Regulation (9 VAC 25-32-10 *et seq.*).
- Part I.D.6. **Reliability Class:** *Identical to Part I.D.7. of the previous permit.* Required by SCAT Regulations 9 VAC 25-790.
- Part I.D.7. **Treatment Works Closure Plan:** *Identical to Part I.D.8. of the previous permit.* Required for all STPs, per the State Water Control Law at 62.1-44.18.C. and 62.1-44.15:1.1., and the SCAT Regulations at 9 VAC 25-790-450.E. and 9 VAC 25-790-120.E.3.

Part I.D.8. **Reopeners:**

New Requirement: a. Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

Identical to Part I.D.9. of the previous permit: c. 9 VAC 25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Identical to Part I.D.5. of the previous permit: d. Required by the VPDES Permit Regulation, 9 VAC 25-31-220.C, for all permits issued to STPs.

Part II CONDITIONS APPLICABLE TO ALL VPDES PERMITS. VPDES Permit Regulation 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

State "Transmittal Checklist" to Assist in Targeting Municipal and Industrial Individual NPDES Draft Permits for Review

Part I. State Draft Permit Submission Checklist

Facility Name:

authorized in the permit?

treatment process?

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Endless Caverns STP

NPD	DES Permit Number:	VA0071846				
Perr	mit Writer Name:	Dawn Jeffries				
Date	e :	July 12, 2011				
Ma	ajor []	Minor [X]	Industrial []	Muni	cipal []
I.A.	Draft Permit Package S	ubmittal Includes	: :	Yes	No	N/A
1. F	Permit Application?			Х		
	Complete Draft Permit (for ncluding boilerplate inform		me permit – entire permit,	х		
3. (Copy of Public Notice?				Х	
4. (Complete Fact Sheet?			Х		
5. /	A Priority Pollutant Screen	ing to determine p	parameters of concern?		Х	
6. /	A Reasonable Potential ar	nalysis showing ca	alculated WQBELs?	Х		
7. [Dissolved Oxygen calculate	tions?		Х		
8. \	Whole Effluent Toxicity Te	st summary and a	nalysis?			Х
9. I	Permit Rating Sheet for ne	w or modified ind	ustrial facilities?			Х
I.B.	Permit/Facility Characte	eristics		Yes	No	N/A
1. I	ls this a new, or currently u	unpermitted facility	<i>i</i> ?		X	
			ned sewer overflow points, non- ility properly identified and	х		

X

3. Does the fact sheet **or** permit contain a description of the wastewater

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?		X	
5. Has there been any change in streamflow characteristics since the last permit was developed?		Х	
Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?	Х		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?		X	
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	Х		
Have any limits been removed, or are any limits less stringent, than those in the current permit?		X	
10. Does the permit authorize discharges of storm water?		Х	
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any WQBELs based on an interpretation of narrative criteria?		Х	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		Х	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record <u>only</u> for POTWs)

II.A. Permit Cover Page/Administration	Yes	No	N/A
Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	Х		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements	Yes	No	N/A
Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	Х		
2. Does the fact sheet discuss whether "antibacksliding" provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (POTWs)	Yes	No	N/A
Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	х		
 Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133? 	х		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that a exception consistent with 40 CFR 133.103 has been approved?	n		х
Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	Х		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g average monthly) and short term (e.g., average weekly) limits?	., Х		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		Х	
a. If yes, does the record provide a justification (e.g., waste stabilization pond trickling filter, etc.) for the alternate limitations?	,		Х

II.D. Water Quality-Based Effluent Limits	Yes	No	N/A
Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	Х		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?	Х		

11.1	D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
3.	Does the fact sheet provide effluent characteristics for each outfall?	Х		
4.	Does the fact sheet document that a "reasonable potential" evaluation was performed?	Х		
	a. If yes, does the fact sheet indicate that the "reasonable potential" evaluation was performed in accordance with the State's approved procedures?	X		
	b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
	c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have "reasonable potential"?	X		
	d. Does the fact sheet indicate that the "reasonable potential" and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	х		
	e. Does the permit contain numeric effluent limits for all pollutants for which "reasonable potential" was determined?	X		
5.	Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	Х		
6.	For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	Х		
7.	Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	Х		
8.	Does the record indicate that an "antidegradation" review was performed in accordance with the State's approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements		No	N/A
Does the permit require at least annual monitoring for all limited parand other monitoring as required by State and Federal regulations?			
a. If no, does the fact sheet indicate that the facility applied for and granted a monitoring waiver, AND, does the permit specifically in this waiver?			Х
2. Does the permit identify the physical location where monitoring is to performed for each outfall?	b be	Х	
3. Does the permit require at least annual influent monitoring for BOD alternative) and TSS to assess compliance with applicable percent requirements?		х	
4. Does the permit require testing for Whole Effluent Toxicity?		Х	

II.F. Special Conditions		No	N/A
Does the permit include appropriate biosolids use/disposal requirements?	Х		
2. Does the permit include appropriate storm water program requirements?			Х

II.F. Special Conditions – cont.		Yes	No	N/A
3.	If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			Х
4.	Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			Х
5.	Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		Х	
6.	Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
	a. Does the permit require implementation of the "Nine Minimum Controls"?			X
	b. Does the permit require development and implementation of a "Long Term Control Plan"?			Х
	c. Does the permit require monitoring and reporting for CSO events?			X
7.	Does the permit include appropriate Pretreatment Program requirements?			Х

II.G. Standard Conditions		Yes	No	N/A	
 Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions? 			Х		
List of Standard Conditions – 4	0 CFR 122.41				
Duty to comply Duty to reapply Need to halt or reduce activity not a defense Duty to mitigate Proper O & M Permit actions	Property rights Duty to provide information Inspections and entry Monitoring and records Signatory requirement Bypass Upset	Transfer Monitorir Compliar 24-Hour	change ted noncompliance		
equivalent or more stringent o	dditional standard condition (or the onditions) for POTWs regarding nand new industrial users [40 CFR	otification of			х

Part III. Signature Page

Based on a review of the data and other information submitted by the permit applicant, and the draft permit and other administrative records generated by the Department/Division and/or made available to the Department/Division, the information provided on this checklist is accurate and complete, to the best of my knowledge.

Name	Dawn Jeffries
Title	Environmental Engineer
Date	July 12, 2011